



Lost in Decentralization: Caseload driven Quality Control in pediatric surgery

Dr. med. Miriam Wilms, MScIH

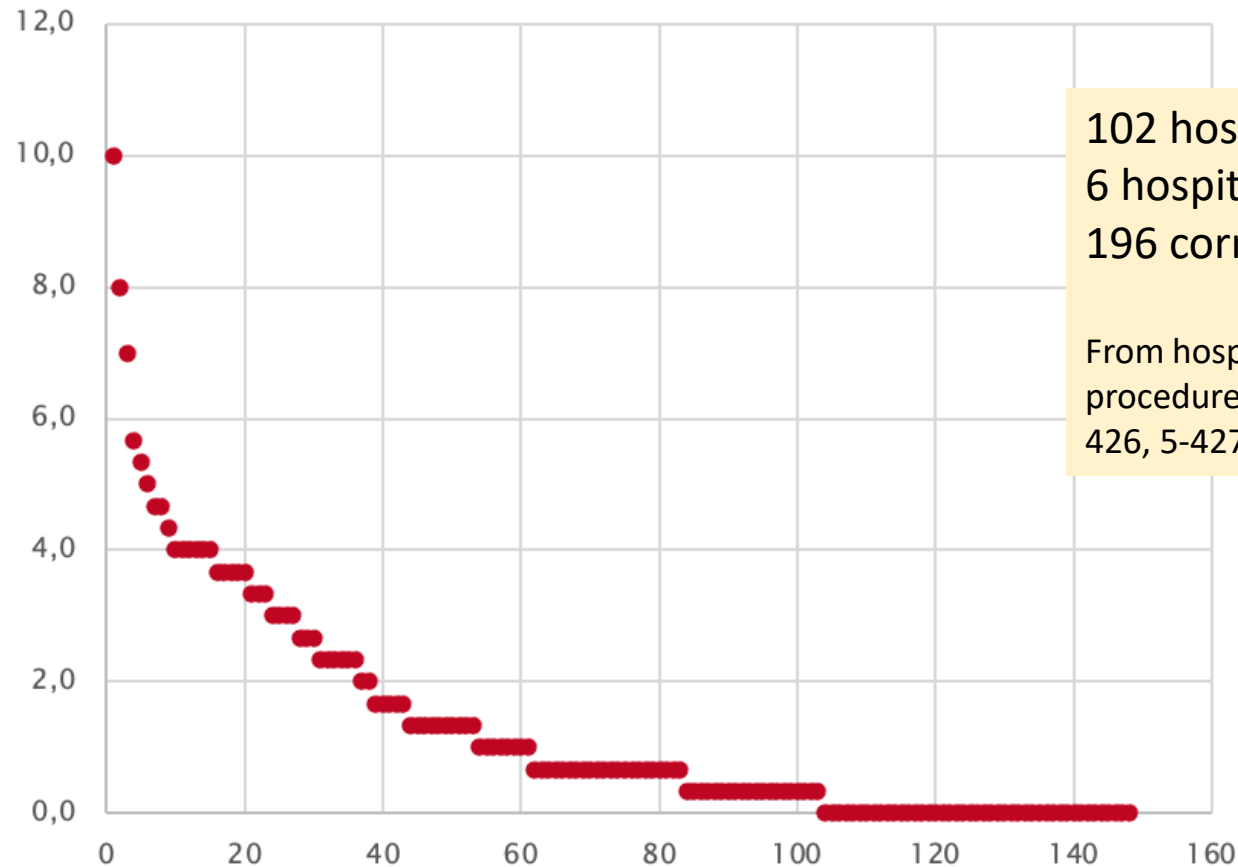
University Hospital Düsseldorf, Department of General-, Visceral-, Thorax and
Pediatric Surgery, Düsseldorf, Germany

Patient Organization for People with Anorectal Malformations and Morbus
Hirschsprung (SoMA e.V.), Munich, Germany

KEKS Symposium 2024

Care Situation for Corrective Surgery for EA in the years 2020-2022

Average cases per hospital per year



102 hospitals performed corrective surgery for EA
6 hospitals had a mandatory minimal caseload of 5
196 corrective surgeries per year on average from 2020-2022

From hospital discharge data: ICD-10 Q39 in combination with at least one procedure code 5-428.0, 5-428.1, 5-428.2, 5-428.3, 5-428.5, 5-428.7, 5-424, 5-426, 5-427, 5-438, in patients <18 years of age

Number of hospitals participating

Caseload University Hospitals

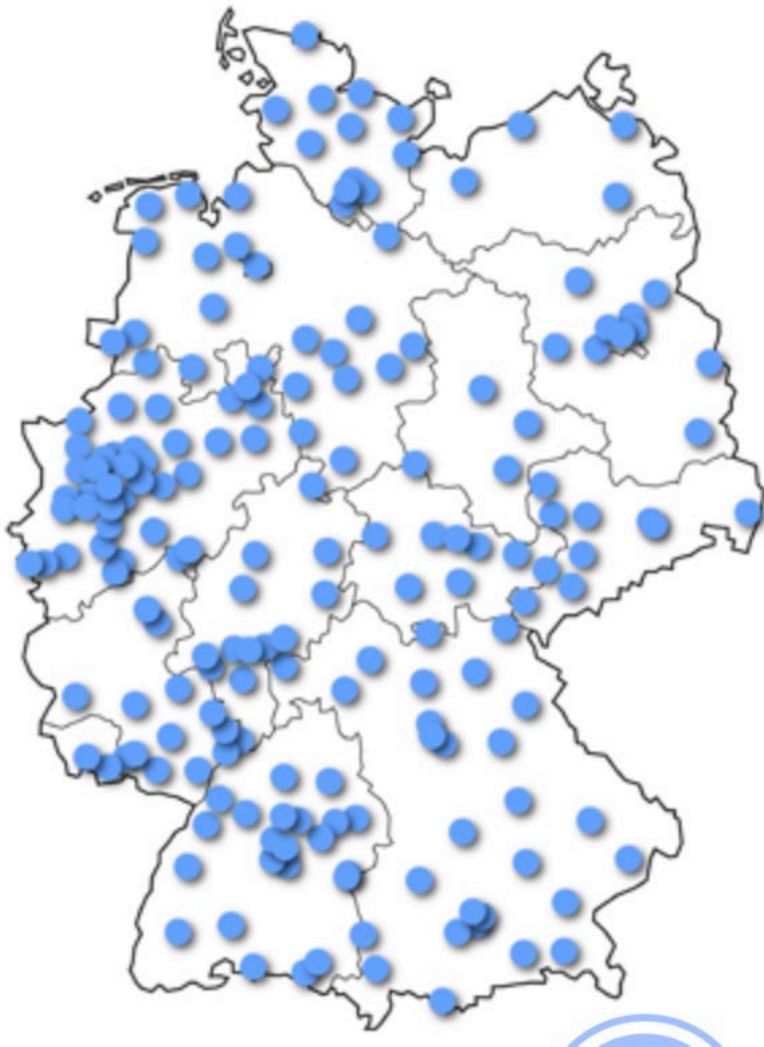
Lacher M et al. Operative Volume of Newborn Surgery in German University Hospitals: High Volume Versus Low Volume Centers. Eur J Pediatr Surg. 2022

19 University Hospitals with professorship

EA/TEF (N=249)			
Volume (range)	Hospitals (N)	Cases in 3 y (N; %)	Annual cases per center (median)
High (20-30)	4	100 (40.2%)	8
Medium (15-19)	4	66 (26.5%)	6
Low (2-14)	11	83 (33.3%)	2

	Total (N)	Esophageal atresia/TEF	Duodenal atresia	Small bowel + colonic atresia	Anorectal malformations (ARM)	Congenital diaphragmatic hernia (CDH)	Gastroschisis	Omphalocele	Hirschsprungs disease	Posterior urethral valves (PUV)	NEC/FIP/gastric perforation
Patients 2015	677	77	56	35	102	104	48	41	69	44	101
Patients 2016	744	92	58	31	112	122	51	37	61	56	124
Patients 2017	741	80	48	39	116	112	59	47	59	52	129
Patients (3 y)	2,162	249	162	105	330	338	158	125	189	152	354
Median per center (3 y)	101	13	8	6	17	7	8	5	10	10	15
Range per center (3 y)	18-258	2-30	1-21	0-11	1-43	1-188	1-19	1-15	0-25	0-21	3-49

QFR-RL and complex malformations



		Prävalenz je 10 000	N, hochgerechnet Deutschland 2020
Spina bifida	Q05.x	2.9	220
Kritische Herzfehler	Q22.0 ... Q26.2	37.8	2.865
GI-Trakt- u. Bauchwanddefekte		19.4	1.470
Ösophagusatresie	Q39.0, Q39.1	2.6	197
Duodenal-/Dünndarmatresie	Q41.x	4.1	311
Analatresie	Q42.x	5.4	409
Zwerchfellhernie	Q79.0	2.6	197
Omphalozele	Q79.2	2.0	152
Gastroschisis	Q79.3	2.7	205
Gallengangsatresie	Q44.2	0.6	45
Blasenexstrophie	Q64.1, Q64.2	0.4	30
Urethralklappen	Q64.2, Q79.4	1.6	121

Kröger J et al, *Neonatology* 2022

1600 cases of complex malformations

8000 cases of VLBW Infants

Roughly 160 perinatal centers of the highest level in 2023

Quality control in Neonatology versus Pediatric surgery

Neonatology/Perinatal Medicine	Pediatric surgery
QS Verfahren Neonatology QS Verfahren Perinatal Medicine	-
Voluntary certifications: <ul style="list-style-type: none"> • “Ausgezeichnet. Für Kinder” • “Babyfreundlich” • “Certkom” • “periZert” 	ERNICA certification KEKS e.V. certification
Levels of Perinatal Centers through legislation (QFR-RL)	-
Mandatory minimal caseload for very low birth weight infants <1250g	-
Transsar<1250g	-

Volume-Outcome Relation for EA in the literature

Esophageal atresia: Data from a national cohort

Rony Sfeir   • [Arnaud Bonnard](#) • [Naziha Khen-Dunlop](#) • ... [Myriam Pouzac](#) • [Alain Duhamel](#) • [Frederic Gottrand](#) • [Show all authors](#)

DOI: <https://doi.org/10.1016/j.jpedsurg.2013.03.075>

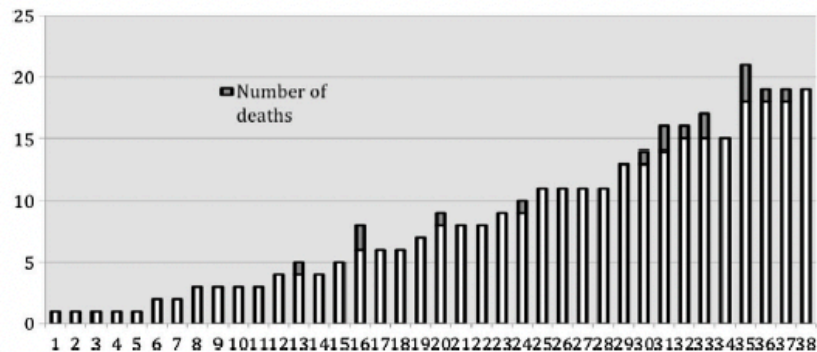


Fig. 1 Number of cases in 2008–2009 per center and survival. Each bar represents total cases during the 2-year study in each single center participating in the register. In white the number of alive patients, in black the dead patients.

307 EA corrective surgeries in 2 years.
154 per year in 38 hospitals. 24 had less than 5 cases per year, 13 had more than 5 cases per year but less than 10, and 1 hospital had 11 cases per year.

“Caseload experience does not significantly affect the survival of patients with EA. Our study showed clearly that low levels of experience might be sufficient, as no difference in survival was noted in centers with fewer than five new cases per year.”

Volume-Outcome Relation in Hirschsprung's

Relationships Between Hospital and Surgeon Operative Volumes and Surgical Outcomes in Hirschsprung's Disease

[Jordan C. Apfeld, MD](#) • [Richard J. Wood, MD](#) • [Devin R. Halleran, MD](#) • [Katherine J. Deans, MD, MHSc](#) •
[Peter C. Minneci, MD, MHSc](#) • [Jennifer N. Cooper, PhD](#)  

Published: September 03, 2020 • DOI: <https://doi.org/10.1016/j.jss.2020.08.014> •



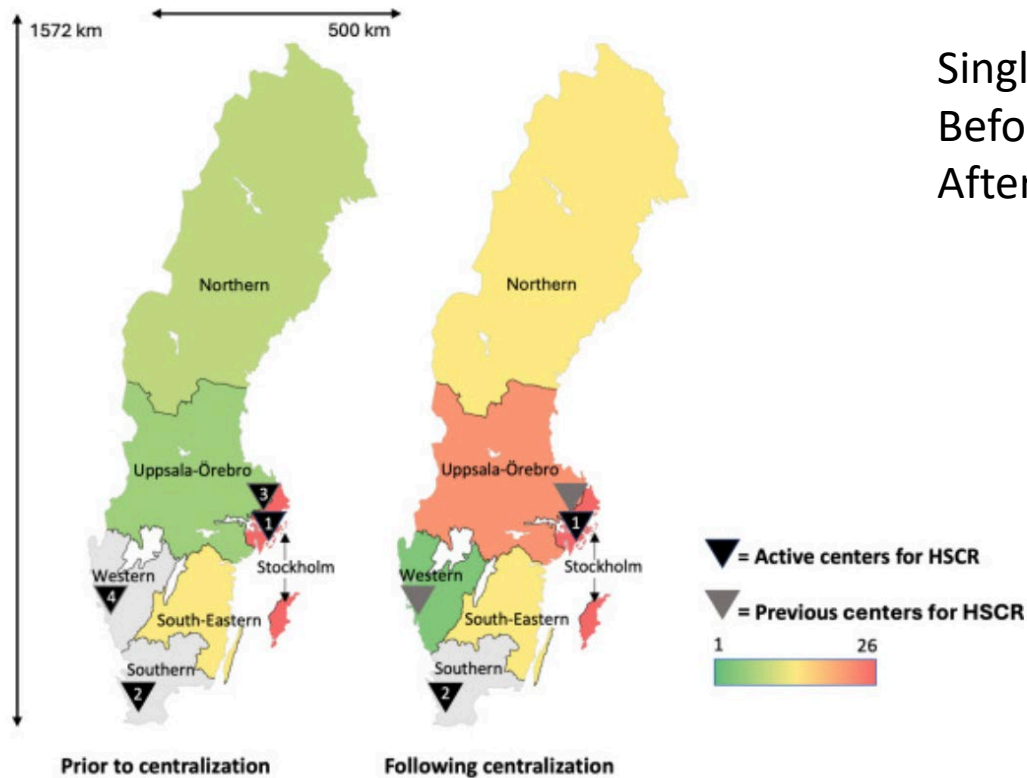
The median annual surgeon volume was 1.5 procedures (IQR 1-2.5)
The median annual hospital volume was 9.5 procedures (IQR 7-13).

“Neither surgeon nor hospital PT volumes were significantly associated with readmission or reoperation rates for infants with Hirschsprung's disease.”

National centralization of Hirschsprung's disease in Sweden: A comparison of preoperative management and outcomes

[Linnea Söderström](#)   • [Anna Gunnarsdottir](#) • [Jenny Oddsberg](#) • [Pär-Johan Svensson](#) • [Tomas Wester](#) • [Anna Lof Granström](#)

Open Access • Published: May 16, 2024 • DOI: <https://doi.org/10.1016/j.jpedsurg.2024.05.007>



Single Center Stockholm University Hospital:
Before centralization: 7,2 HD pullthroughs per year.
After centralization: 11,4 HD pullthroughs per year.

volume-outcome relation in pediatric surgery

CDH:

- Bucher BT et al: Impact of hospital volume on in-hospital mortality of infants undergoing repair of congenital diaphragmatic hernia. *Ann Surg* 2010; 252: 635–642.
- IJsselstijn H, et al. Defining outcomes following congenital diaphragmatic hernia using standardised clinical assessment and management plan (SCAMP) methodology within the CDH EURO consortium. *Pediatr Res*. 2018 Aug;84(2):181-189. doi: 10.1038/s41390-018-0063-3. Epub 2018 May 29. PMID: 29915407.
- Snoek KG et al. Congenital Diaphragmatic Hernia: 10-Year Evaluation of Survival, Extracorporeal Membrane Oxygenation, and Foetoscopic Endotracheal Occlusion in Four High-Volume Centres. *Neonatology*. 2018;113(1):63-68. doi: 10.1159/000480451. Epub 2017 Oct 28. PMID: 29080897.

Gallengangsatresie:

- Durkin N, Davenport M. Centralization of Pediatric Surgical Procedures in the United Kingdom. *Eur J Pediatr Surg*. 2017 Oct;27(5):416-421. doi: 10.1055/s-0037-1607058. Epub 2017 Sep 25. PMID: 28946167

Gastrochisis:

- Morche J et al. Relationship between volume and outcome for gastroschisis: A systematic review. *J Pediatr Surg*. 2022 Dec;57(12):763-785. doi: 10.1016/j.jpedsurg.2022.03.022. Epub 2022 Mar 28. PMID: 35459541.
- McAteer JP et al. Influence of Surgeon Experience, Hospital Volume, and Specialty Designation on Outcomes in Pediatric Surgery: A Systematic Review. *JAMA Pediatr*. 2013;167(5):468–475. doi:10.1001/jamapediatrics.2013.25

Pediatric Central Venous Catheter Implantation:

- Fritsch, Lena-Marie MD*; Le, Melanie MD*; Elrod, Julia MD*, †; Wössmann, Wilhelm MD, PhD‡; Vincent, Deirdre MD*; Reinshagen, Konrad MD, PhD*; Boettcher, Michael MD, PhD*, †. Surgical Experience Affects the Outcome of Central Venous Access Catheter Implantation in Children: A Retrospective Cohort Study. *Journal of Pediatric Hematology/Oncology* 45(2):p 57-62, March 2023. | DOI: 10.1097/MPH.0000000000002463

High volume centers for esophagectomy: what is the number needed to achieve low postoperative mortality? FREE

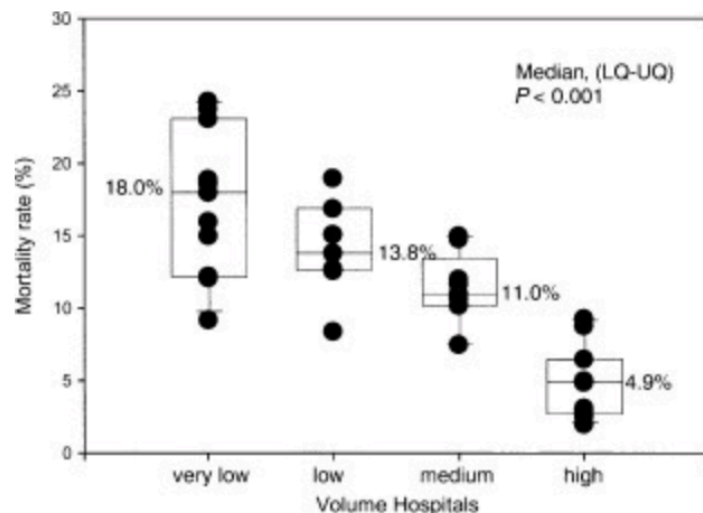
R. Metzger ✉, E. Bollschweiler, D. Vallböhmer, M. Maish, T. R. DeMeester, A. H. Hölscher

Diseases of the Esophagus, Volume 17, Issue 4, 1 December 2004, Pages 310–314,

<https://doi.org/10.1111/j.1442-2050.2004.00431.x>

Published: 01 December 2004

Figure 1



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Number of esophagectomies (very low, < 5; low 5–10; medium, 11–20; and high > 20 operations per year) and median percentage of mortality rates. Results of 13 papers published between 1998 and 2003.

Year	Author	Begin	End	Region
2003	Wenner ¹⁰	1987	1996	Sweden
	Finlayson ¹³	1995	1997	USA (nationwide inpatient sample)
	Urbach ¹⁴	1994	1999	Ontario Canada
	Dimick ¹⁵	1994	1998	USA Maryland
2002	Gillison ⁹	1992	1996	Great Britain
	Birkmeyer ⁷	1997	1997	USA (Medicare)
2001	Kuo ¹⁶	1992	1999	USA (Massachusetts)
	Dimick ⁵	1984	1999	USA (Maryland)
2000	Swisher ¹⁷	1994	1996	USA (Medicare)
	van Lanshot ⁶	1993	1998	Netherlands
1999	Gordon ¹⁸	1990	1997	USA (Maryland)
	Begg ⁴	1984	1993	USA (SEER-report)

Association of Surgical Volume With Perioperative Outcomes for Esophagomyotomy for Esophageal Achalasia

[Francisco Schlottmann](#), MD,^{✉1} [Paula D. Strassle](#), MSPH,^{1,2} and [Marco G. Patti](#), MD^{1,3}

A retrospective population-based analysis from January 1, 2000, through December 31, 2013.

7488 patients were included

- 5278 patients (70.5%) underwent esophagomyotomy in high-volume hospitals; >10 cases/year
- 1349 (18.0%) in intermediate-volume hospitals; 5-10 cases/year
- 861 (11.5%) in low-volume hospitals; <5 cases per year

low- and intermediate-volume hospitals had higher rates of postoperative bleeding, cardiac failure, renal failure, and respiratory failure. High volume hospitals were associated with shorter length of hospital stay

Tragende Gründe



Gemeinsamer
Bundesausschuss

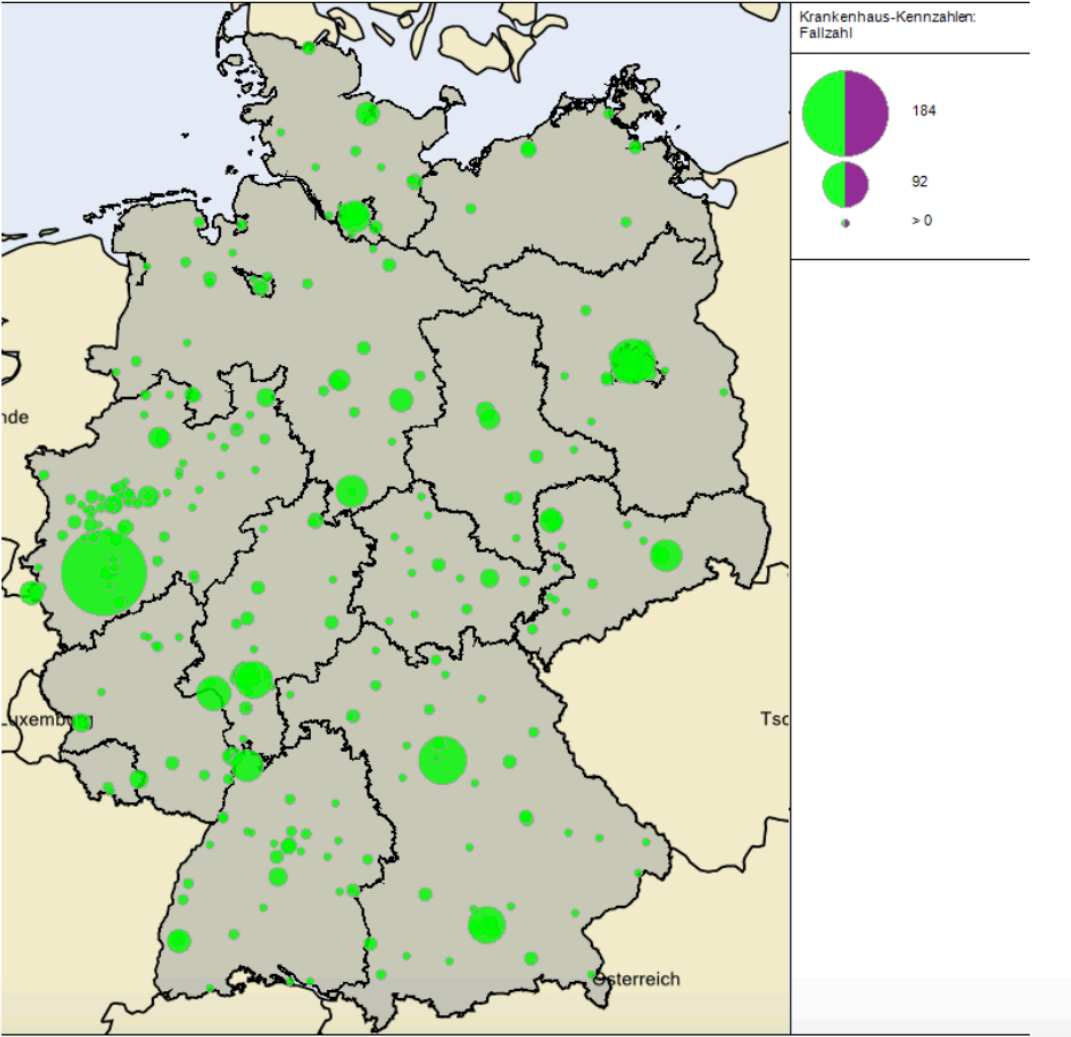
**zum Beschluss des Gemeinsamen
Bundesausschusses über eine Änderung der
Regelungen gemäß § 136b Absatz 1 Nummer 2
SGB V für nach § 108 zugelassene Kranken-
häuser (Mindestmengenregelungen – Mm-R):
Änderung der Nr. 3 der Anlage**

Vom 17. Dezember 2020

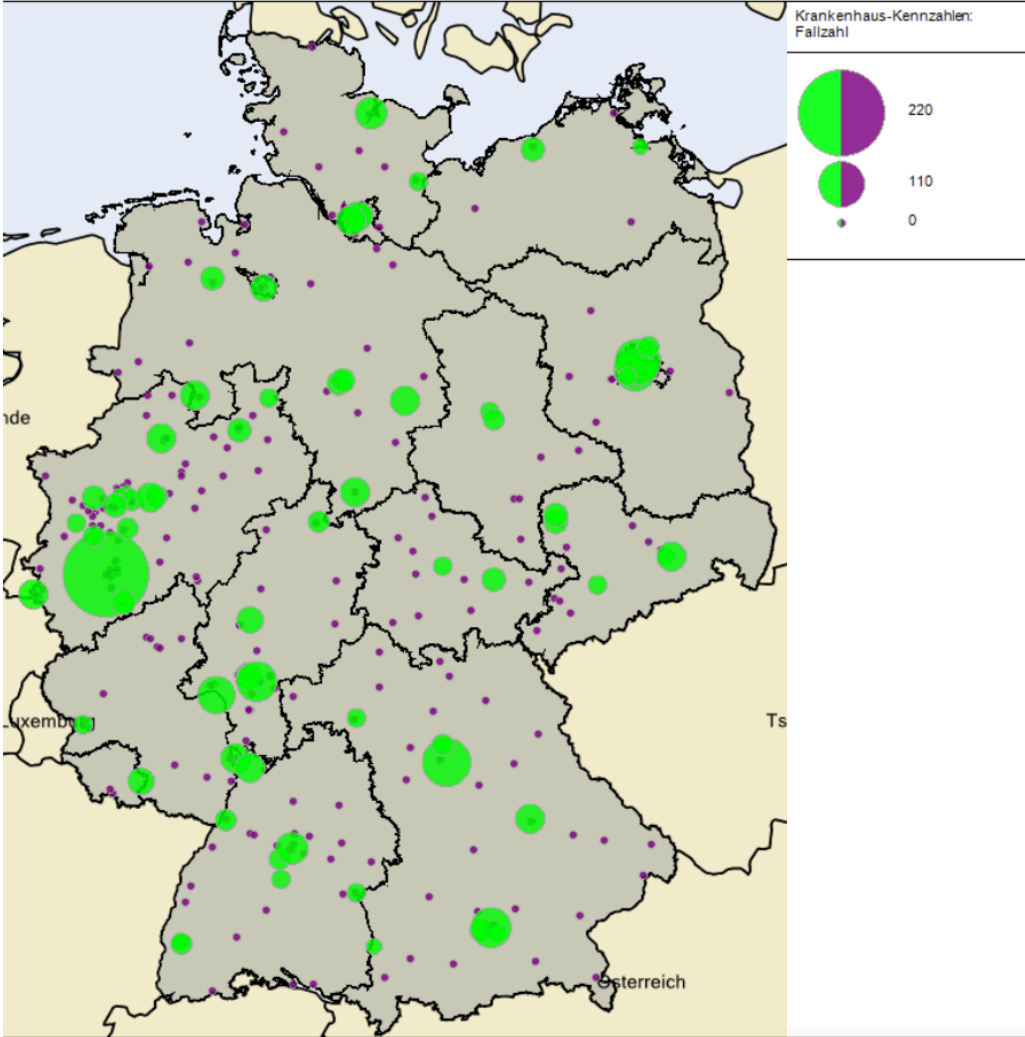
...)The establishment of a minimum volume requirement is necessary as a quality standard that goes beyond medical training and hospital planning regulations (...)

Medical training regulations alone do not ensure the necessary continuous, nationwide experience and routine in terms of acquiring practical competencies with corresponding target numbers. (...)

327 hospitals performing esophageal surgeries for adults in Germany in 2018



69 hospitals performing esophageal surgeries for adults in Germany in 2024



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SOMA e.V.

Dr. med. Miriam Wilms, MScIH

University Hospital Düsseldorf, Department of
General-, Visceral-, Thorax and Pediatric Surgery,
Düsseldorf, Germany

Patient Organization for People with Anorectal
Malformations and Morbus Hirschsprung (SoMA e.V.),
Munich, Germany

m.wilms@soma-ev.de